



UNITED STATE PATENT AND TRADEMARK OFFICE

In re application of :  
Application No. : 10/734,948  
Filed : December 11,2003  
For : NON-AZEOTROPIC REFRIGERANT  
MIXTURE, REFRIGERATING CYCLE  
AND REFRIGERATING DEVICE  
Examiner : LEUNG, RICHARD L.  
Art Unit : 3744

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**TRANSMITTAL OF APPEAL BRIEF**

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Sir:

Transmitted herewith is an Appeal Brief in ( 12 ) pages, including ( 2 ) pages of Appendix, in triplicate.

Also enclosed are:

- (X) A check in the amount of \$ 500 to cover the fee set forth in 37 CFR 1.17(c) for filing an Appeal Brief.
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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EX PARTE ICHIRO KAMIMURA et al.

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Application for Patent

Filed December 11, 2003

Serial No. 10/734,948

FOR:

NON-AZEOTROPIC REFRIGERANT MIXTURE,  
REFRIGERATING CYCLE AND REFRIGERATING DEVICE

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APPEAL BRIEF

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### APPENDIX A - CLAIMS ON APPEAL



I. REAL PARTY IN INTEREST

The entire right, title and interest in this patent application is assigned to Sanyo Electronic Co., LTD.

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any other appeals or interferences which will directly affect or be directly affected by the Board's decision in the present pending appeal.

III. STATUS OF THE CLAIMS

A total of 8 claims were presented during the prosecution of this application. Claims 1, 3 and 5-8 have been amended. Claims 1-8 are now pending, have been finally rejected, and this appeal is taken from the Examiner's final rejection of claims 1-8.

IV. STATUS OF THE AMENDMENTS

An amendment was filed after Final Rejection, on Feb. 7, 2005, and the amendment included amendments on claims, specification, and drawing on FIG. 3. Proposed amendments have been entered.

The Advisory Office Action still rejects claim 5 and 6, under 35 U.S.C. 112, second paragraph. Applicants have amended claims 5 and 6 to correct typographic errors and therefore to overcome the rejection under 35 U.S.C. 112, second paragraph.

A copy of the newly amended claims 1-8 based on the amendments after Final is presented in the appendix A below.

## V. SUMMARY OF THE INVENTION

The present invention is directed to a non-azeotropic refrigerant mixture, which is used in a refrigerating cycle. The refrigerant mixture has the temperature glide to produce a first temperature range between a beginning temperature and an intermediate temperature in an evaporation process for use as a refrigeration area, and a second temperature range from the intermediate temperature to an ending temperature of the evaporation process for use as a cold storage area. In this manner, the performance can be improved.

## VI. ISSUES

*Were claims 1-3 properly rejected under 35 U.S.C. 102(b) as being anticipated by Richard et al. (U. S. Patent 5,736,063; hereinafter Richard)?*

*Were claims 4, 7/4, and 8/7/4 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Radermacher et al. (U. S Patent 5,092,138; hereinafter Radermacher) in view of Richard?*

*Was claim 5 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl (U. S. Patent 6,178,761) in view of Richard?*

*Were claims 7/5 and 8/7/5 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Radermacher?*

*Was claim 6 properly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Vander Woude et al. (U. S. Patent 6,631,621; hereinafter Vander)?*

## VII. GROUPING OF THE CLAIMS

For the ground of rejection contested by appellant in this appeal, claims 1-8 may be treated as one group to stand or fall together. Claim 1, the sole independent claim pending, may be taken as representative for the issue on appeal.

## VIII. ARGUMENTS

### A. The related law

1. The standard for lack of novelty (i.e. anticipation) is one of strict identity. To anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

For a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference. .... These elements must be arranged as in the claim under review, ... but this is not an 'ipsissimis verbis' test. *In re Bond*, 910, F. 2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

The inquiry as to anticipation is symmetrical with the inquiry as to infringement of a patent. A classic test of anticipation provides : That which will infringe, if later, will anticipate, if earlier. *Knapp v. Morss*, 150 U.S. 221, 37 L. Ed. 1059, 14 S. Ct. 81 (1893); *Lindermann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1459,

221 U.S.P.Q. 481 (Fed. Cir. 1984). Therefore, by analogy, the all elements rule used for a determination of infringement finds its applicability in a determination of anticipation.

Discussion of the all elements rule can be found in *Becton Dickinson and Co. v. C.R. Bard Inc.*, 17 U.S.P.Q. 2d 1962, 1967 (Fed. Cir. 1989) and *Hi-Life Products Inc. v. American National Water-Mattress Corp.*, 6 U.S.P.Q.2d 1132, 1133 (Fed. Cir. 1988).

2. A prima facie case of obviousness requires that the reference teachings “appear to have suggested the claimed subject matter.” *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143, 147 (CCPA 1976). To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

When more than one reference or source of prior art is required in establishing the obviousness rejection, “it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.” *In re Lalu*, 747 F.2d 703, 223 USPQ 1257, 1258 (Fed. Cir. 1984). There must be some motivation to combine the references; this motivation must come from “the nature of the problem to be solved, the teachings of the prior art, [or] the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

Finally, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d, 1596 (Fed. Cir. 1988).

B. The rejections

*Claims 1-3 were improperly rejected under 35 U.S.C. 102(b) as being anticipated by Richard.*

1. The rejections

The Final Office Action, dated Dec. 07, 2004, rejected claims 1-3 under 35 U.S.C. 102(b) as being anticipated by Richard. The Advisory Office Action, dated March 11, 2005, remains rejections on the present invention. The Examiner considers that “the cold storage area” and “the refrigeration area” are just the intended uses derived from the property of the composition and failed to provide any chemical features to the claimed composition. The Examiner then further states that Richard discloses a refrigerant mixture that has the identical composition to the present invention.

2. The prior art

Richard discloses several refrigerant compositions in Table 2, in which the ingredient including CO<sub>2</sub> may be included.

However, Richard suggests that the temperature glide results in not being wide use on non-azeotropic refrigerant (col. 2, lines 17-19). In other words, Richard suggests an opposite result to the present invention. Richard does not disclose how to make use of the temperature glide to produce the “storage area” and the “cold storage area”.

3. The prior art distinguished

Independent claim 1 has specifically recited that the temperature glide is used to produce the two temperatures ranges, so that the “storage area” and the “cold storage



area” can be created based on the two specific temperature ranges. This is not just an intended use in the claimed invention.

The present invention as recited in claim 1, the temperature glide produces a first temperature range between a beginning of an evaporation and an intermediate temperature for use as a refrigeration area, and a second temperature range from the intermediate temperature to a temperature at an ending of the evaporation for use as a cold storage area. In this manner, the refrigerating performance can be improved (i.e. see [0019]). The features recited in claim 1 are not just the intended use.

In re Richard, clearly, the composition *alone* does not teach or suggest a technological design in practical applications, such as the claimed invention. In other words, the disclosure just based on, i.e., composition of HFC (example 27 in Table 2), does not equivalently teach a structural design of refrigerator. The present invention is directed to technology to design i.e. the refrigerator to have “refrigeration area” and the “cold storage area”, based on the property of “temperature glide”, created by the claimed refrigerant mixture. No prior art reference has specifically disclosed this arrangement.

It is therefore submitted that Richard does not contain all the essential elements of the present invention as recited in independent claim 1 and dependent claims 2-3. In consequence, the rejection of claims 1-3 under 35 U.S.C. 102 as being anticipated by Richard is submitted to be improper, and the Board is respectfully requested to cause these rejections to be withdrawn.

*Claims 4, 7/4, and 8/7/4 were improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Radermacher in view of Richard.*

*Claim 5 was improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard.*

*Claims 7/5 and 8/7/5 were improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Radermacher.*

*Claim 6 was improperly rejected under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Vander Woude.*

1. The rejections

The Office Action rejected claims 4-8 under 35 U.S.C. 103(a). Specifically, The Office Action rejected claims 4, 7/4, and 8/7/4 under 35 U.S.C. 103(a) as being unpatentable over Radermacher in view of Richard. The Office Action rejected claim 5 under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard. The Office Action rejected claim 7/5 and 8/7/5 under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Radermacher. The Office Action rejected claim 6 under 35 U.S.C. 103(a) as being unpatentable over Karl in view of Richard and further in view of Vander.

2. The Prior Arts

Richard does not disclose the temperature glide to produce “*the refrigeration area*” and “*the cold storage area*”.

Prior art references of Radermacher, Powell, Karl, and VanderWoude do not supply the missing feature in Richard about the claimed features as recited in claim 1.

3. The prior art distinguished

Claims 4-8 are directed to refrigerating cycle and device, using the non-azeotropic refrigerant mixture as recited in claim 1, so that the temperature glide is used to produce the specific temperature ranges for the refrigeration area and the cold storage area in operation.

In other words, prior art references do not teach or suggest the temperature glide to produce the temperature ranges used as "*the refrigeration area*" and "*the cold storage area*".

It is therefore submitted that the prior art references in combinations do not contain all the essential elements of the present invention as recited in claims 4-8 include the features recited in claim 1. In consequence, the rejection of claims 4-8 under 35 U.S.C. 103 as being unpatentable by the prior art references is submitted to be improper, and the Board is respectfully requested to cause these rejections to be withdrawn:

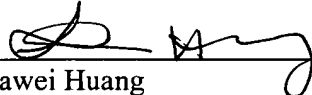
#### IX. CONCLUSION

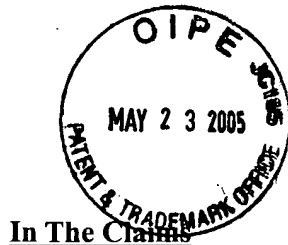
As noted, the Examiner has not properly applied 35 U.S.C. § 102 and §103 in his rejection of the claims at issue. As such, Applicants believe that the rejections under 35 U.S.C. § 102 and §103 to be in error, and respectfully request the Board of Appeals and interferences to reverse the Examiner's rejections of the claims on appeal.

Date: 5 / 18 / 2005

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Respectfully submitted,  
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## APPENDIX A - CLAIMS ON APPEAL

1. (previously presented) A non-azeotropic refrigerant mixture, comprising carbon dioxide and at least one kind of combustible refrigerant, and having a temperature glide, wherein the temperature glide produces a first temperature range between a beginning temperature and an intermediate temperature in an evaporation process for use as a refrigeration area, and a second temperature range from the intermediate temperature to an ending temperature of the evaporation process for use as a cold storage area.

2. (original) The non-azeotropic refrigerant mixture of claim 1, wherein the combustible refrigerants are hydrocarbons.

3. (previously presented) The non-azeotropic refrigerant mixture of claim 1, wherein the combustible refrigerant is combustible HFC refrigerants.

4. (original) A refrigerating cycle, in which a compressor, a heat radiator, an expansion mechanism and an evaporator are connected by a refrigerant path, characterized in that the non-azeotropic refrigerant mixture of claim 1 is circulated in the refrigerating cycle.

5. (currently amended ) A refrigerating cycle, in which a compressor, a heat radiator, an expansion mechanism and an evaporator are connected by a refrigerant path, characterized in that the non-azeotropic refrigerant mixture of claim 1 is circulated in the refrigerating cycle, and the non-azeotropic refrigerant mixture is subjected to a ~~super~~ super critical state at a high pressure side of the evaporator.

6. (currently amended) A refrigerating cycle, in which a compressor, a heat radiator, an expansion mechanism and an evaporator are connected by a refrigerant path, characterized in that the non-azeotropic refrigerant mixture of claim 1 is circulated in the refrigerating cycle, the non-azeotropic refrigerant mixture is subjected to a ~~super~~ super critical state at a high

pressure side of the evaporator, and the evaporator is operated at a triple point temperature, - 56.6°C, of the carbon dioxide.

7. (previously presented) A refrigerating device, comprising:

the refrigerating cycle of any one of claims 4-6; and

at least one additional evaporator added in the refrigerating cycle to establish a plurality of evaporators, wherein a low temperature evaporator and a high temperature evaporator that can be operated at a high temperature higher than that of the low temperature evaporator are arranged in series.

8. (previously presented) The refrigerating device of claim 7, wherein an auxiliary heat exchanger for performing a heat exchange is arranged between a refrigerant path at the heat radiator side that is formed between an outlet side of the heat radiator and an inlet side of the expansion mechanism, and a refrigerant path at the evaporator side that is formed between an outlet side of the plurality of evaporators and an inlet side of the compressor.